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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/744,489	01/23/2001	Lisa Joanne Drewe	41577/252464	5644

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EXAMINER	
CHUNDURU, SURYAPRABHA	
ART UNIT	**PAPER NUMBER**
1637	

DATE MAILED: 03/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/744,489	DREWE ET AL.	
	Examiner	Art Unit	
	Suryaprabha Chunduru	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 January 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,5,6,8-12,14,16 and 18-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5,6,8-12,14,16 and 18-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Applicants' response to the office action filed on January 18, 2005 has been entered.

2. The instant application filed on January 23, 2001, is a 371 of PCT/GB99/02317 filed on July 19, 1999.

3. Claims 1-2, 5-6, 8-12, 14, 16, and 18-24 are pending.

Response to arguments

4. Applicants' response to the office action is fully considered and found not persuasive. All arguments have been fully considered and thoroughly reviewed, but are deemed not persuasive for the reasons that follow. This action is made FINAL.

5. The following are the rejections made in the previous office action:

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 5-6, 9, 12, 22-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Seeger et al. (Biotechniques, Vol. 23, No.3, page 512-514, 516,517, 1997).

Seeger et al teach a method of claims 1, and 6, for detecting the presence of a target nucleic acid containing purine-rich region (see page 516, col. 1, line 4-7, col. 2, line 1-4), in a sample or purine –rich region is introduced in to the target during PCR with one of primers containing plurality of purines (page 513, col.2 paragraphs 3-5 under PCR procedure section) comprising

(a) amplifying said target (which includes purine-rich region) (see page 2798, col. 1, paragraph 1-2 under sub-heading analysis of PCR products);

(b) during step(a) contacting the sample with peptide nucleic acid probe (PNA) that binds to said target (see page 513, col.1, paragraph 2 of the sample preparation procedure sub heading, col. 2, paragraphs 1-5 of PCR procedure subtitle, col. 3, paragraph 2 under results and discussion);

(c) detecting the presence of target by detecting the target: probe complex (triplex-structure) (see page 513, col. 3, lines 5-10);

With regard to claim 2, Seeger et al. teach that said PNA is bis-PNA (see page 513, col. 3, paragraph 1 under results and discussion section);

With regard to claim 5, 22, Seeger et al. teach that the amplification reaction is a PCR (see page 513, col.2, paragraphs 1-5 under PCR procedure section);

With regard to claim 9, 23, Seeger et al. teach that said PNA is immobilized (page 513, col. 1, paragraph 2 of the sample preparation procedure section);

With regard to claim 12 and 24, Seeger et al. teach that the triplex structure (target-probe complex) is detected using a gel retardation detector (see page 513, col. 3, lines 5-10).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 14-16, 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seeger et al. (Biotechniques, Vol. 23, No.3, page 512-514, 516,517, 1997) in view of Felgner et al. (USPN.6,165,720).

Seeger et al teach a method for detecting the presence of a target nucleic acid containing purine-rich region (see page 516, col. 1, line 4-7, col. 2, line 1-4), in a sample or purine –rich region is introduced in to the target during PCR with one of primers containing plurality of purines (page 513, col.2 paragraphs 3-5 under PCR procedure section) comprising

(a) amplifying said target (which includes purine-rich region) (see page 2798, col. 1, paragraph 1-2 under sub-heading analysis of PCR products);

(b) during step(a) contacting the sample with peptide nucleic acid probe (PNA) that binds to said target (see page 513, col.1, paragraph 2 of the sample preparation procedure sub heading, col. 2, paragraphs 1-5 of PCR procedure subtitle, col. 3, paragraph 2 under results and discussion);

(c) detecting the presence of target by detecting the target: probe complex (triplex-structure) (see page 513, col. 3, lines 5-10);

Seeger et al. teach that said PNA is bis-PNA (see page 513, col. 3, paragraph 1 under results and discussion section); the amplification reaction is a PCR (see page 513, col.2, paragraphs 1-5 under PCR procedure section);said PNA is immobilized (page 513, col. 1, paragraph 2 of the sample preparation procedure section); the triplex structure (target-probe complex) is detected using a gel retardation detector (see page 513, col. 3, lines 5-10).

However Seeger et al. did not teach detection of the target using a wave guide detector.

Felgner et al. teach a method for detecting a target nucleic acid using PNA probe labeled with fluorescent labels (FRET labels) and monitoring the hybridization and detecting the signal by a wave guide detector (surface plasmon resonance detector), spectrofluorometer (see col. 14, line 21-58). Felgner et al. also teach a kit comprising PNA, target nucleic acid (plasmid DNA comprising a complementary sequence) (see col. 11, line 61-67, col. 12, line 1-9).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of detecting a target nucleic acid comprising purine-rich region as taught by Seeger et al. with the step of adding a wave guide detector as taught by Felgner et al. to achieve expected benefit of developing an enhanced and improved method for detecting a target nucleic acid in a sample because Felgner et al. the use of FRET assay in monitoring the formation and dissociation of triple helices (See col. 14, line 24-58). An ordinary practitioner would have been motivated to modify the method of detecting a target nucleic acid as taught by Seeger et al. by incorporating the fluorescence resonance energy transfer labels and detection by spectroflurometer to develop a method that would provide a sensitive detection assay for monitoring and quantitating a target nucleic acid.

Response to the arguments:

8. With regard to the rejection under 35 USC 102(b) as anticipated by Seeger et al. , Applicants' arguments are fully reviewed and found not persuasive. Applicants argue that the instant claims are directed to a method for detecting the presence or absence of a target nucleic acid and argue that the method of purification as taught by Seeger et al. does not anticipate the instant invention. Applicants also argue that Seeger et al. did not disclose the amplified target genes will bind to the PNA probes and detection of amplification products. Applicants' arguments are fully considered and found unpersuasive. First, preamble is not given any patentable weight because the method as discosed by Seeger et al. anticipates the method steps as recited in the instant claims. Second, the instant claims recite detection of triplex structures based on the binding of PNA probes bound to a portion of a target nucleic acid, and does not recite amplified target genes will bind to the PNA probes. Thus the limitation upon which the arguments are based, is *not* present in the claims. Further the method as disclosed by Seeger et al. inherently teaches the method for detecting the presence or absence of the targeted nucleic acid because PNA probes are targeted to capture the genomic DNA, which is subsequently amplified and the separation of the amplified DNA is based on the PNA probe bound PCR products (see Fig.2 and for specific agene amplification see Fig. 3).

Applicants on page 2 of the remarks, argue that the detection is entirely using conventional gel electrophoresis and detection in the instant invention is based on PNA probe-target binding. This argument is fully considered and found unpersuasive, because the instant claim 1 recites detection of the presence or absence of the target nucleic acid which is entirely qualitative that meets the limitation of using a conventional gel electrophoresis and the detection is based on the detection of PNA bound PCR products on the gel.

Applicants argue that examiner refers to page 216 and that page number is in correct, Applicants correctly pointed out that the incorrect page number. Examiner herein provides the correct page number as 514, col. 1. Applicants argue that the instant claims 1 and 8 lacks a target having a purine-rich region and the purine-rich region is introduced during amplification and Seeger et al. does not disclose the introduciton of purine-rich region during amplification and does anticipate the instant claims. Applicants' arguments are fully considered and found not persuasive. Seeger on page 514, col.1 discloses introduction of triplex forming PNA probes having purine-rich region which are introduced in to the amplification products during PCR amplification and subsequently the separation or analysis or detection of the target nucleic acid is based on the triplex forming target capture PNA probes. Thus Seeger et al. does disclose the introduction of purine-rich region during amplification. Further the instant claims do not recite a target nucleic acid lacking a purine-rich region. Applicants' also argue that the instant claims 1, 6, and 18 recites detection of triplex structures indicates the target nucleic acid present in the sample. And the detection step is not disclosed by Seeger et al. Applicants' arguments are fully considered and found not persuasive because the instant claims do not recite any specific means of detection and the detection by means of gel electrophoresis do not exclude the broader scope of the instant claims.

Applicants, arguments based on fig.1 and the gel mobility distances based on triplex forming PNA probe, are fully reviewed and found unpersuasive because Fig. 1 shows amplification of PNA captured plasmid DNA, which certainly gives one size molecular weight that corresponds to the triplex forming PNA probe bound to the target nucleic acid, and the amplification reaction does not comprise any free PNA probes in the reaction mixture to give a second product that

lacks triplexes, thus the gel shift basically shows only one PCR product, that is the triplex structure. Thus the disclosure of Seeger et al. does anticipate the instant invention and the rejection is maintained herein.

9. with regard to the rejection under 35 USC 103(a) applicants' arguments are fully reviewed and found unpersuasive. As discussed above, Seeger et al. does disclose introduction of purine-rich regions during amplification and it is obvious to one skilled in the art to use know fluorescence techniques as cited by Felgner et al. to modify the method of Seeger et al. to achieve an improved and sensitive detection of the target DNA. Applicants argue that Felger et al. does not teach any sort of fluorescence label detector and thus the instant claims are not obvious over Seeger et al. in view of Felger et al. Applicants' arguments are unpersuasive because Felger et al. does teach detecting a target nucleic acid using PNA probe labeled with fluorescent labels (FRET labels) and monitoring the hybridization and detecting the signal by a wave guide detector (surface plasmon resonance detector), spectrofluorometer (see col. 14, line 21-58). Felgner et al. also teach a kit comprising PNA, target nucleic acid (plasmid DNA comprising a complementary sequence) (see col. 11, line 61-67, col. 12, line 1-9). Thus it is obvious that a fluorescent label can be detected using the detector means as taught by Felger et al. with out any secondary considerations. Thus the rejection is maintained herein.

Conclusion

No claims are allowable.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Suryaprabha Chunduru whose telephone number is 571-272-0783. The examiner can normally be reached on 8.30A.M. - 4.30P.M , Mon - Friday,.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on 571-272-0782. The fax phone number for the organization where this application or proceeding is assigned is 571-573-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Suryaprabha Chunduru
Examiner
Art Unit 1637.

JEFFREY FREDMAN
PRIMARY EXAMINER
3/15/08